4N6XPRT StifCalcs™ "Manual"

INTRODUCTION:

The purpose of our writing the 4N6XPRT StifCalcs™ program is to allow for easier access to the NHTSA Crash Test data. Part of the "easier access" concept is to allow the typical user to:

- Rapidly determine if NHTSA has a test for a certain vehicle with a certain impact location
- Search the data base for all tests across the rear range the vehicle is the "same" based upon identifying the desired vehicle Year, Make, and Model
- Search the data base for all tests of "Sister" vehicles across the rear range the vehicle is the "same" based upon identifying the desired vehicle Year, Make, and Model
- Display all the selected matches from the database broken into their general impact "classes" - Frontal impact, Side impact, Rear impact, and Other impact
- Easily search the database for similar class vehicles when there is no test for a desired vehicle.

This has been accomplished.

As a secondary consideration, we wanted to provide some "base" calculations for stiffness values based upon the test data, with the realization that no one set of stiffness values will handle all situations, at least not well. Therefore, for each test we provide multiple sets of A-B-G stiffness values and leave it to the user to pick the appropriate values for their given collision analysis. This also has been accomplished.

We hope that you find the program as useful as we do, and welcome your questions and suggestions for possible improvements.

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FREQUENTLY ASKED QUESTIONS:

Why can't I find any tests when I use the BASIC VEHICLE SEARCH, yet the vehicle has been tested by NHTSA?? This is most likely due to an incompatibility between model name between the Sister/Clone list maintained by Greg Anderson and the model name used by NHTSA. Incompatibility can be ANYTHING which is different between the two names - spelling, characters, spacing, etc.

Why can't I find all of the available tests for a vehicle and its Sisters & Clones when I use the BASIC VEHICLE SEARCH?? This is most likely due to an incompatibility between model name(s) between the Sister/Clone list maintained by Greg Anderson and the model name(s) used by NHTSA. Incompatibility can be ANYTHING which is different between the two names - spelling, characters, spacing, etc.

Why can't I find the vehicle manufacturer or model when I use the BASIC VEHICLE SEARCH, yet the vehicle has been tested by NHTSA?? This is most likely due to the vehicle being outside of the year range covered by the Sister/Clone list maintained by Greg Anderson.

Why are there so many Stiffness Values for a given test? Several reasons. First, our presentation of stiffness values mirrors our belief that no one set of values will fit every situation. Second, our presentation allows you to quickly develop a range of damage speeds, in a manner that should be easily explainable to a judge and/or jury, based upon data from one test. Third, there are up to three different sets of c rush depths and two crush widths from which to calculate stiffness values, as well as two different methods of calculating average crush. Depending upon which data set(s) you choose to use will determine how many calculated stiffness sheets you will end up with.

Which values do I use?? It depends upon the type of test, Front, Rear, or Side.

Front - The initial point to start at would be Vehicle Width, Trapezoidal Average Crush, 5 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported along with your preference.

Rear - The initial point to start at would be Vehicle Width, KE Equivalent Speed, Trapezoidal Average Crush, 5 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported along with your preference.

Side - The initial point to start at would be Indentation Length, KE Equivalent Speed, Trapezoidal Average Crush, 2 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported along with your preference.

Data Retrieval -

BASIC SEARCH:

To retrieve data through the basic search method, simply 1) pick the year, 2) pick the make, 3) pick the model, and 4) click on the "NHTSA TEST SELECTION" tab. Select the test you want to review.

ADVANCED SEARCH:

If you do not find a test of the type you want/need (i.e. - side impact), you need to do a "ADVANCED VEHICLE SEARCH". First approach - duplicate your basic vehicle search by selecting the appropriate MODEL and then click on the SEARCH button. You can refine this search by clicking on the impact location desired (Front/Side/Rear/Other) and by inputting the start and end year. When you click the SEARCH button, the tests which meet your search criteria show up in the box along the bottom of the window. When you see a test which you want to look at more closely, note the test number, then click on the test. This will then put you on the "NHTSA TEST SELECTION" tab. Now find and select the test number you wanted to review.

If NO tests come up for the model you are looking for, or the similar model(s) as identified in the Sister/Clone list, you have the capability to build your own "Class" of similar vehicle.

Class based on WEIGHT. The weights contained in the NHTSA Crash Test database are **loaded weights**, not curb. Generally, the additional load is comprised of dummies and test recording instrumentation. This load generally ranges from 500-800 pounds over the curb weight.

The best way to find a base test weight for your search is to look at the weight of the vehicle in some other test. If there are no tests for your desired vehicle in the database, use a curb weight from a published source, such as Expert AutoStats, and add your guess of what the load weight desired is. One way of estimating the load weight is.... use your best estimate of the load weight in your collision.

When inputting the weight MIN and MAX values, start your range as +/- 50 pounds or so, then expand the range as you find necessary to get a valid test in your search results.

Class based on WHEELBASE. Determine the wheelbase of your desired class vehicle based upon a test of your desired vehicle, or from a published source, such as Expert AutoStats.

When inputting the weight MIN and MAX values, start your range as +/- 1 inch or so, then expand the range as you find necessary to get a valid test in your search results.

Class based on LENGTH. Determine the wheelbase of your desired class vehicle based upon a test of your desired vehicle, or from a published source, such as Expert AutoStats.

When inputting the weight MIN and MAX values, start your range as +/- 1 inch or so, then expand the range as you find necessary to get a valid test in your search results.

Class based on BODYSTYLE. Select the body style you want to search for.

Class based on IMPACT LOCATION. Select the Impact location(s) you want to search for.

The more criteria used for the "class" the more similar the tests will be to your subject vehicle, but the less likely it will be that you find any tests.

You can also start out with one, or two, criteria, search the database, then add criteria and re-search the database to narrow the number of tests to review.

When you see a test which you want to look at more closely, note the test number, then click on the test. This will then put you on the "NHTSA TEST SELECTION" tab. Now find and select the test number you wanted to review.

TEST SELECTION:

Once you are on the "NHTSA TEST SELECTION" tab, you can select a test for review. The available tests come from matching the selected Year/Make/Model to the Sister/Clone list, then searching the NHTSA Crash Test database for the tests that meet the Start & End year constraints of the Sister/Clone list and also meet the Make/Model and similar vehicle constraints of the Sister/Clone list. To select a test, click on the test, making sure that the little hour glass shows up after clicking on the test.

Guidelines for which test to select are:

Does the VDI clock position match the impact location? - 12 for front, 3 or 9 for side, and 6 for rear tests.

Does the PDOF match the impact location? - 0 for front, 90 or 270 for side, an 180 for rear tests. Keep in mind that the Frontal tests can have a PDOF of 180 depending upon the reporting agency.

On frontal tests the CF is close to 21, on side or rear tests the CF is close to 27.

The Year/Make/Model of the test vehicle matches the Year/Make/Model of your subject vehicle.

There are no errors in the crush measurements.

The impact speed of the test is a close match to the suspected impact speed of your subject collision.

These are IDEAL guidelines!!! Unfortunately, it is difficult to get a test that matches up to all of these guidelines. This is the first area that you get to apply your expertise, review the available tests and you determine which test(s) best meet your criteria for this collision.

RESULTS:

Once you have selected a test, you may examine the following tabs for selected information -

TEST INFORMATION - look for the following items
Contract/Study Title, Test Objective(s), Test Type, Closing Speed, and Test Commentary - are these consistent with your collision? Is there anything in these areas which raise questions? Is there something here that makes you want to look at a different test, saying it/they are available?

OCCUPANT INFORMATION - depending upon the case, multiple fields may be of interest, such as: contact region(s), position with respect to the vehicle, HIC, G's, or force loadings on the dummy, and restraints in use for the test.

VEHICLE INFO - For the purposes of calculating stiffness values, the following information is of importance:

Crush Depths - On front and rear tests, there is a possibility for three sets of crush depth measurements: Maximum Crush, Damage Profile Distances (DPD), and Pre test minus Post test measurements. These three sets of measurements can be seen on the top half of the vehicle printout, or on the Vehicle Summary page. Side impact tests may record the Pre test minus Post test measurements, but they are meaningless for the purposes of calculating stiffness values.

Damage Width - There are two possible damage width measurements, Vehicle Width and Total Length of Indentation. Both are applicable to front and rear tests, if present. For side tests only the Total Length of Indentation is applicable.

Weight - A Vehicle Test Weight is required, and if this is a side or a rear test, test weights are needed for both the impactor and the target

Speed - A closing speed is needed.

STIFFNESS CALCS - From the damage depths and damage widths reported, we allow you to view stiffness values for each of the combinations. We also allow you to view the differences between the Trapezoidal and "Simple" methods of calculating the average crush depth when appropriate. Finally, we allow you to see the stiffness value change between using the closing speed and KE Equivalent Speed for side and rear tests.

When applying stiffness values to your collision, which values to use as your starting point depends upon the impact location:

Front - The initial point to start at would be Vehicle Width, Trapezoidal Average Crush, 5 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported along with your preference.

Rear - The initial point to start at would be Vehicle Width, KE Equivalent Speed, Trapezoidal Average Crush, 5 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported along with your preference.

Side - The initial point to start at would be Indentation Length, KE Equivalent Speed, Trapezoidal Average Crush, 2 mph Rated No Damage Speed. Which set of crush measurements to use is determined by what NHTSA reported along with your preference.